Technical Appendix 8.2B: Vegetation Survey of Proposed Turbine Locations Survey Report for Achany Extension

Alba Ecology Ltd.

June 2021

Registered Office: Coilintra House, High Street, Grantown on Spey, Moray PH26 3EN Tel: 01479 870238, enquires@albaecology.co.uk

Summary

Alba Ecology Ltd. was commissioned by Wood plc to conduct a vegetation assessment at the proposed turbine locations for Achany Extension, a proposed wind farm site in Sutherland.

A total of 23 proposed turbine locations were visited in September 2020 using the grid reference locations provided on the 11/09/20 by the client. The vegetation type at each proposed turbine location was assessed and a summary of the findings is provided.

[Based on the results of this assessment, an additional site visit was also undertaken by Wood Ecologist in October 2020 to evaluate suitable alternative locations identified throughout the design iteration process. Habitat descriptions and condition commentary for new proposed turbine locations provided by Wood (following the same method) have been italicised in Table 8.2.3. Following this survey visit, NVC mapping and Peatland Condition Assessment (PCA) and Turbine Vegetation assessments have informed further micro-siting design work, which has resulted in alterations to locations as well as removal of turbine siting options – this is presented in Annex 1 - Table 8.2.4.]

Based on the final layout, a total of 13 turbine locations were on the National Vegetation Classification (NVC) community M15c - wet heath. A total of four turbine locations are on blanket bog habitat, NVC communities M17a, M17b or M19 with a further three on wet heath/blanket bog transitional habitat (M15/M17).

Impacts from deer grazing were noted throughout the vegetation, including hoof prints, dung and tracks. Micro-erosion features, likely associated with deer grazing, were common within the wet heath and blanket bog communities.

Bog pools were features of the habitat surrounding some of the turbine locations, particularly within the M17a community.

It was considered that much of the blanket bog was unlikely to be actively forming peat. However, some of the blanket bog, e.g. the M17a blanket bog, particular at particularly at T04 (original location, now microsited away), T16 and T20, was considered to be better condition and may be partially or actively forming peat.

This document reports the findings of the vegetation assessment at turbine locations undertaken by Alba Ecology Ltd. in September 2020.

Introduction

Alba Ecology Ltd. was commissioned by Wood plc to conduct a vegetation assessment at the proposed turbine locations for Achany Extension, a proposed wind farm development in Sutherland.

A total of 23 proposed turbine locations were visited in September 2020 using the turbine locations, as circulated on 10-11/09/2020 by the client (Figure 8.2.1, Table 8.2.1). The vegetation type at each proposed turbine location was assessed including the National Vegetation Classification (NVC) community, consideration of the peatland condition and through assessment of surface water features and impacts such as drainage.

A further site visit was undertaken by Wood Ecologist to evaluate suitable micro-siting options at 4 locations. Habitat descriptions and condition commentary for new proposed turbine locations provided by Wood have been included within this report following the same method outlined in this report and italicised in Table 8.2.3.

This document reports the findings of the vegetation assessment undertaken by Alba Ecology Ltd. in September 2020. Alba Ecology has previously conducted a NVC survey for much of the Study Area in 2012.

Figure 8.2.1: Figure of proposed turbine locations circulated on 10/09/2020

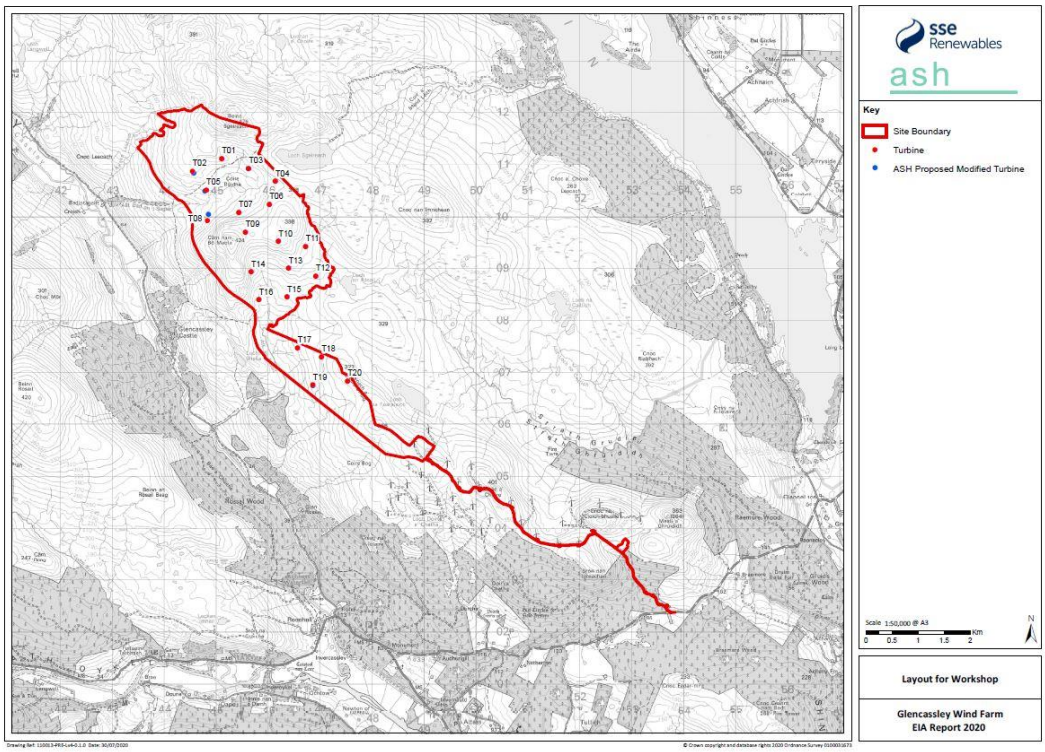


Table 8.2.1: Turbine locations circulated on 11/09/20

nitial design layout as provided on 11/09/20 **Additional turbine locations evaluated by Wood (yellow)**	**Grid reference**
T01	NC 45108 11121
T02	NC 44607 10839
T02 - Option	NC 44550 10839
T03	NC 45656 10892
T03 - Option	**NC 45618 10923**
T04	NC 46140 10678
T04 - Option	**NC 45979 10740**
T05	NC 44780 10490
T06	NC 46023 10241
T07	NC 45487 10137
T08	NC 44872 10018
T09	NC 45566 09700
T09 - Option	**NC 45597 09765**
T10	NC 46198 09516
T11	NC 46722 09421
T12	NC 46915 08855
T13	NC 46390 09004
T14	NC 45674 08931
T14 - Option	**NC 45810 09163**
T15	NC 46365 08448
T16	NC 45755 08290
T17	NC 46591 07357
T17 – Option	NC 46564 07472
T18	NC 47082 07264
T18 – Option	NC 47025 07297
T19	NC 46860 06752
T20	NC 47531 06835

Aims and Objectives

The objectives for this survey and report:

- Visit each proposed turbine locations and consider the habitat type and vegetation community present; and
- Consider any peatland habitat present at each of the proposed turbine locations in relation to the habitat condition and potential for peat formation (so called ‘activity’).
- To assist in the decision-making regarding the movement or removal of turbines as part of the design iteration workshops.

Methods

The walkover survey of the turbine locations was conducted by Dr Kate Massey of Alba Ecology at the same time as the updated NVC, Peatland Condition Assessment (PCA) groundwater dependent terrestrial ecosystem (GWDTE) survey, as reported in Technical Appendix 8.2. The NVC methods and communities, as reported in this document, relate to the descriptions in the NVC, PCA and GWDTE survey report (**Technical Appendix 8.2A**) and should be read alongside.

This vegetation assessment provides a focussed, detailed and site-specific consideration of the vegetation at the proposed turbine locations and does not supersede the NVC, PCA and GWDTE survey as reported in **Technical Appendix 8.2A**. A standard methodology for this type of focussed survey approach has not yet been developed. However, this survey draws upon various published information and guidance (e.g. Lindsay, 1995, Lindsay *et al.* 2014a-c, SNH, 2016, Glenk *et al.* 2017,) and uses well established vegetation assessment techniques, such as quadrats.

Each proposed turbine location was visited in September 2020. At each location the NVC community was assigned and the peatland condition was assessed. The methods and definitions for the PCA are detailed in **Technical Appendix 8.2A**. At a selection of the turbine locations a 2×2m quadrat was placed over a representative vegetation sample and the percentage cover recorded for each plant species.

Peatland activity is the formation of peat when plant material does not decompose due to water-logged conditions. The PCA Support Tool gives descriptions of peatlands as being in good, intermediate or bad condition and considers likely activity in peatlands (Glenk *et al*, 2017). The criteria for these are shown in Table 8.2.2.

The area surrounding (ca. 50m) each proposed turbine location was searched for bog pools and surface water, bog-moss hummocks, erosion features, drainage features and any other features of note such as whether there was a natural surface pattern and presences of any hoof prints and dung etc.

A further site visit was undertaken by Wood Consultant Ecologist Hannah Rowding (BSc, MSc, ACIEEM) from Wood in October 2020 to evaluate suitable micro-siting options at 4 locations. Habitat descriptions and condition commentary for new proposed turbine locations provided by Wood have been included within this report following the same method outlined in this report.

Table 8.2.2: Peatland Condition Assessment Support Tool categories of good, intermediate and bad peatland (Glenk et al*, 2017).*

Signs	Good	Intermediate	Bad
Water	Plenty of water, visible on the surface.	Surface water is rarely visible.	Deep gullies have formed from wind and water erosion.
Vegetation	Small grasses, bog-mosses (*Sphagnum spp*.)	Taller plants, such as cottongrasses (*Eriophorum spp*.) and heather.	Rarely any plants grow on the areas that are exposed. Patches of grasses or heather are still found on ‘islands’ in between exposed bare peat.

Signs	Good	Intermediate	Bad
	common and very wet.		
Bare peat	Little to no bare peat patches.	Bare peat patches are occasional, burning may occur.	Bare peat areas will continue to expand, leaving less plant cover as protection on the surface. Peat will continue to be lost until the solid rock is exposed.
Water quality	Water flowing from good quality peatland is clear.	Water flowing from peatland likely to be slightly brown, especially after heavy rainfall.	Bad water quality, it can be dark brown from the peat content.
Wildlife	Good for wildlife.	Wildlife less abundant than in good condition.	Home too little wildlife.
Resultant activity level	Active.	Stopped growing, inactive.	Inactive.

Limitations

GPS accuracy is typically only to ca. 5-10m and this should be factored in when considering proposed turbine grid reference locations.

A represented sample of vegetation was assessed, avoiding, atypical areas (e.g., haggs).

The other limitations of this survey are common to most vegetation surveys and are reported in detail in Technical Appendix 8.2A and are not repeated in full here for brevity, but include acknowledgement that there is spatial and temporal variation in species appearance, and that the intention of the survey work was not to create a full inventory of all the botanical species in the site.

Nomenclature

Species common names only are used in this report. Scientific names are reported in **Technical Appendix 8.2A**.

Results

Details of each of the considered turbine locations (27 in total), with photos, are provided in Table 8.2.3. The turbine option locations comprise both the initial layout turbine options, as well as alternative options based on follow-up site visit in October 2020 conducted by Wood (additional four locations italicised in Table 8.2.3). Details of the habitat condition at each turbine option location presented is based on early version of the wind farm layout and has helped inform subsequent refinement and micro-siting (See **Annex 1**).

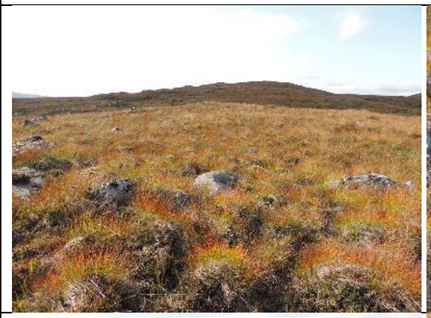
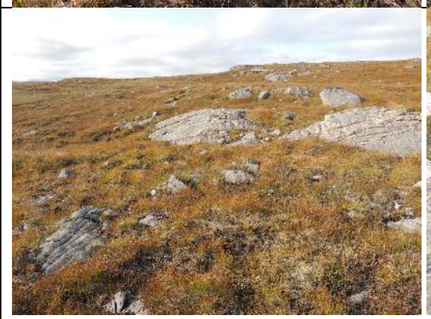
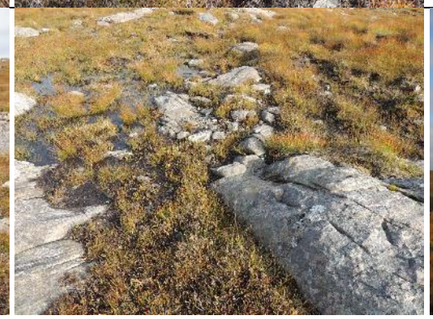
A total of 16 turbine locations were on NVC community M15c, wet heath. These locations were usually dry and deergrass dominated. Some locations had rocks showing through and were clearly on shallow peat, although some turbine locations, e.g. T14, T18 and T-18 (Option) may have been on deeper peat. The locations characterised by M15c generally had few bog-mosses present and bog pools were not a common feature. Grazing impacts were evident throughout much of the vegetation e.g. via hoof prints, dung and micro-erosion features. These relatively heavily grazed areas were considered to be in intermediate condition and so it was considered unlikely that these areas would be actively forming peat.

A total of seven turbine option locations were on blanket bog habitat, NVC communities M17a, M17b or M19 with a further three on transitional wet heath/blanket bog (M15/M17). T04, T07, T16 and T20 were on or near M17a blanket bog and were characterised by open vegetation with bog-mosses abundant in places. Bog pools were frequent at T20 with some low hummock formation and lawns around bog pools. T20 had drainage ditches nearby and there was commonly patches of bare peat in the vegetation. The M17a blanket bog, particular at T16 and T20 was considered to be in intermediate to good condition and may be active or partially active in terms of forming peat. The blanket bog at the other locations were considered likely to be largely inactive and in intermediate condition.

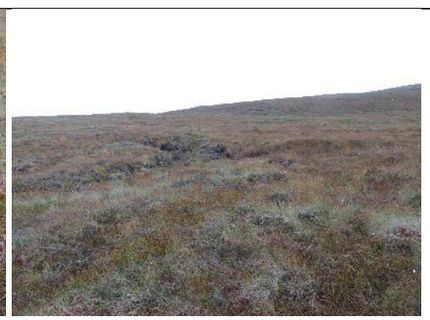
T03 was on marshy grassland M25a community, a community associated with riparian habitats.

A summary table detailing proposed development infrastructure, habitats (Phase 1 and NVC communities present) and site data (including peat depth and altitude) is presented in **Annex 2**.

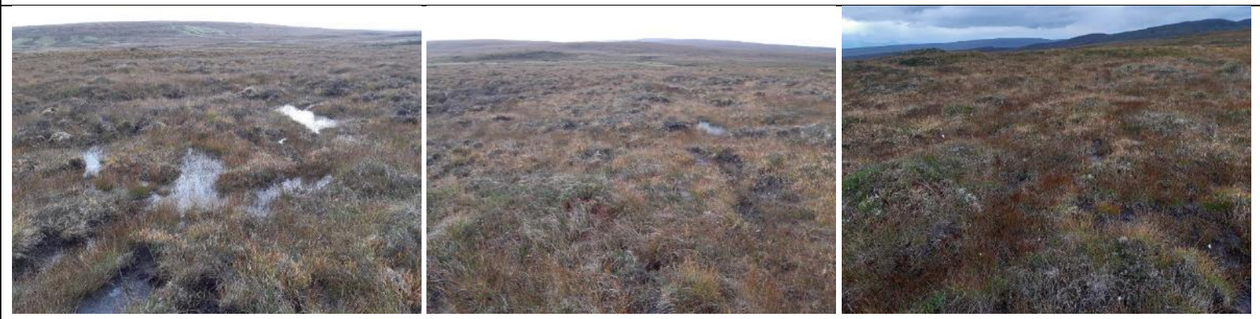
Table 8.2.3: Details of the habitat and condition of the habitat at each turbine location

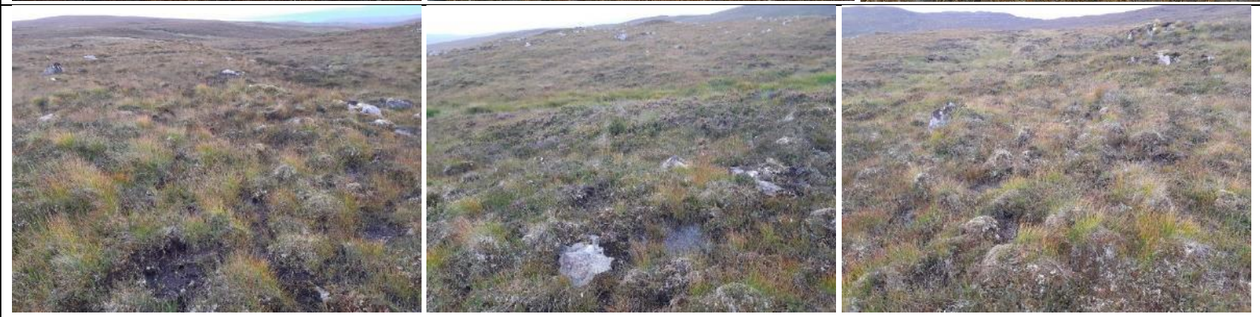
Turbine	Grid reference	NVC Community	Comment	Photos
T01	NC 45111 11116	M15c	**Vegetation**: Rocky and species poor deergrass dominated M15c. **Moss layer**: Little to no bog-mosses present. **Grazing impacts**: Deergrass dominance and bare peat patches are likely associated with grazing pressure. **Erosion**: Micro-erosion features evident as bare peat through open vegetation. **Pools**: No bog pools present. Ground surface dry. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: Area unlikely to be normally peat forming.	 
T02	NC 44613 10841	M15c	**Vegetation**: Rocky and species poor deergrass dominated M15c. **Moss layer**: Little to no bog-mosses present. **Grazing impacts**: Deergrass dominance and bare peat patches are likely associated with grazing pressure. **Erosion**: Micro-erosion features evident as bare peat through open vegetation. **Pools**: No bog pools present. Occasional surface water over peat. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: Area unlikely to be normally peat forming.	  
T02 – Option	NC 44549 10836	M19 on a slope. M15c beside it.	**Vegetation**: A very small patch of M19 on a small slope. It was adjacent to an area of M15c on higher ground. Below the slope there was M25a and M17a in small valley. The M19 patch was dominated by hare's-tail cottongrass with heather abundant. **Moss layer**: Red bog-moss and feather mosses were present. **Grazing impacts**: Heather and hare's tail-cottongrass dominance likely associated with grazing pressure. **Erosion**: No evidence of erosion features in this patch. **Pools**: No bog pools present. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation:** There were no hummocks and hollows present, and no bog pools present. Surface water was not a feature. Area unlikely to be normally peat forming.	  

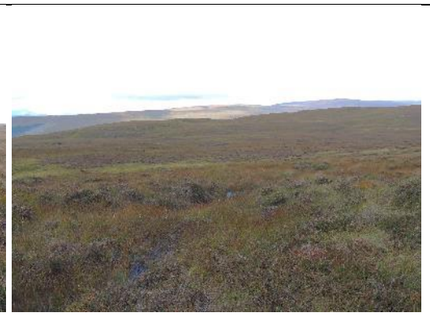
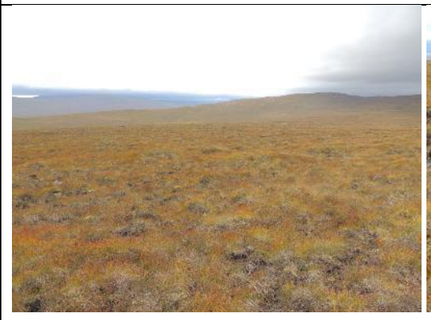
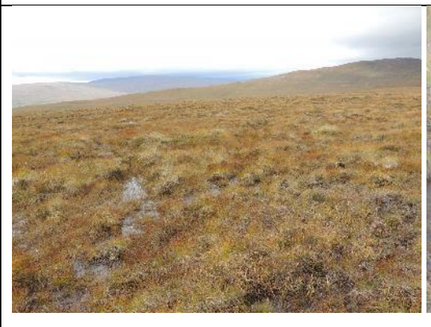
T03	NC 45653 10891	M25a, beside M17a	**Vegetation**: On a patch of M25a dominated by purple moor-grass with a little cross-leaved heath. To one side there was M15c, the other side was M17a but likely on fairly shallow peat as some rocks were evident. **Moss layer**: Wet bog-mosses were not in hummocks, but formed a partial carpet. **Grazing impacts**: Dung was evident in the vegetation. **Erosion**: No erosion features in this patch. **Pools**: There were some elongated pools with bottle sedge in them. The area was generally wet. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation:** Surface water was a feature and there was a partial carpet of bog-mosses. The area may have been partially active.	  
T03 – Option (completed by Wood, October 2020)	NC 45618 10923	M15c	***Vegetation**: On wet heath adjacent to a patch of M25a dominated by purple moor-grass with a little cross-leaved heath. On fairly shallow peat as some rocks were evident.* ***Moss layer**: Little to no bog-mosses present.* ***Grazing impacts**: Dung was evident in the vegetation.* ***Erosion**: Occasional micro-erosion features present.* ***Pools**: No bog pools present. Occasional surface water over peat.* ***PCA**: Modified.* ***Peatland category**: Intermediate.* ***Evidence for peat formation:** Area unlikely to be normally peat forming.*	  
T04	NC 46135 10678	M17a	**Vegetation**: The vegetation was M17a with an even mixture of heather, deergrass, purple moor-grass, hare's-tail cottongrass and common cottongrass with round-leaved sundew and bog asphodel. **Moss layer**: Papillose and red bog-mosses were frequent to abundant, but not a complete carpet. Low hummocks and lawn developed around M2a pools. **Grazing impacts**: Grazing impacts were low. **Erosion**: Some old erosion features nearby and some patches of bare peat in the vegetation. **Pools**: M2a pools with feathery bog-moss. Small lawns of bog-mosses around pools with a variety of species including magellanic bog-moss. Round-leaved and great sundews present. **PCA**: Near Natural **Peatland category**: Good. **Evidence for peat formation**: Bog-mosses were abundant in places. Low hummock formation and lawns around bog pools. The areas was wet with surface water. Area likely to be active forming peat.	  

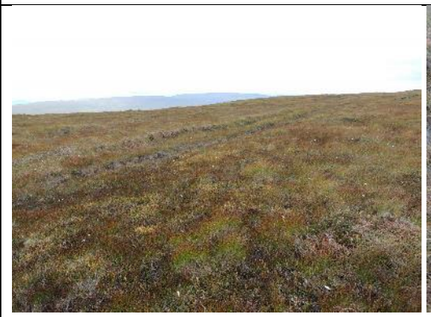
T04 – Option (completed by Wood, October 2020)	NC 45979 10739	M15c	***Vegetation**: Rocky and species poor deergrass dominated M15c.* ***Moss layer**: Little to no bog-mosses present.* ***Grazing impacts**: Deergrass dominance and bare peat patches are likely associated with grazing pressure.* ***Erosion**: Micro-erosion evident as bare peat through open vegetation.* ***Pools**: Water pooling on thin peat and rocky areas.* ***PCA**: Modified* ***Peatland category**: Intermediate- bad.* ***Evidence for peat formation**: Area unlikely to be normally peat-forming*	  
T05	NC 44785 10482	M15c	**Vegetation**: Rocky and species poor deergrass dominated M15c. **Moss layer**: Little to no bog-mosses present. **Grazing impacts**: Deergrass dominance and bare peat patches are likely associated with grazing pressure. **Erosion**: Micro-erosion evident as bare peat through open vegetation. **Pools**: Water pooling on thin peat and rocky areas. **PCA**: Modified. **Peatland category**: Intermediate-bad. **Evidence for peat formation:** Area unlikely to be normally peat forming.	  
T06	NC 46019 10242	M19	**Vegetation**: On a patch of M19. The wider hill slope was of M17b. The M19 included hare's-tail cottongrass, tussocks of heather with crowberry and some patches of red bog-moss and glittering wood-moss. **Moss layer**: Patches of red bog-moss and feather mosses between hare's-tail cottongrass tussocks. **Grazing impacts**: Vegetation type may be associated with grazing pressure. **Erosion**: No obvious erosion features. **Pools**: There were no hummocks or hollows present and no bog pool communities. Surface water was not a feature. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: The area had patchy bog-moss cover and was not very wet underfoot. Area unlikely to be normally peat forming.	  
T07	NC 45481 10136	M17a	**Vegetation**: This location was characterised by M17a blanket bog. It was beside a M6c flush with moving water. The flush was within a patch of M19 blanket bog. **Moss layer**: It was wet underfoot with bog-mosses present, although not forming a complete carpet. **Grazing impacts**: Hoof prints seen in the vegetation. Bare peat patches likely from grazing pressure. **Erosion**: There were bare peat patches within the vegetation and an old erosion feature nearby. **Pools**: The M17a did not have many bog pools within it. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: The area had patchy bog-moss cover and was fairly wet underfoot with a little surface water. Peat formation possible.	  

T08	NC 44869 10012	M17/M15c	**Vegetation**: On a patch of blanket bog that was at a transitional point between M15c and M17. There was some M19 beside it. Hare's-tail cottongrass was only occasional. **Moss layer**: Some bog-mosses present in a depleted layer. **Grazing impacts**: Hoof prints and dung were common. Bare peat patches were likely from grazing pressure. **Erosion**: Micro-erosion features were evident with many bare peat patches. **Pools**: There were no hummocks and hollows. No pools. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: The vegetation surface was fairly dry with few bog-mosses present. The area was unlikely to be normally peat forming.	
T09	NC 45563 09700	M17b	**Vegetation**: This area was M17b blanket bog with many M3 pools on a flat bit of ground between areas of M15c. **Moss layer**: Some bog-mosses present in a depleted layer. **Grazing impacts**: Hoof marks and dung was common. Bare peat patches were likely from grazing pressure. **Erosion**: Bare peat patches evident in the vegetation as micro-erosion features. There were some small erosion features that were likely to be actively eroding. **Pools**: M3 pools and surface water evident. Hummocks and hollows poorly developed. **PCA**: Modified and actively eroding. **Peatland category**: Intermediate-bad. **Evidence for peat formation**: The area was wet, but there was a depleted bog-moss layer. Unlikely to be normally peat forming, but some possible.	
T09 - Option (completed by Wood, October 2020)	NC 45597 09765	M15c	***Vegetation**: Rocky and species poor deergrass dominated M15c.* ***Moss layer**: Little to no bog-mosses present.* ***Grazing impacts**: Deergrass dominance and bare peat patches are likely associated with grazing pressure.* ***Erosion**: Micro-erosion features evident as bare peat through open vegetation.* ***Pools**: No bog pools present. Occasional surface water over peat.* ***PCA**: Modified.* ***Peatland category**: Intermediate.* ***Evidence for peat formation**: Area unlikely to be normally peat forming.*	
T10	NC 46198 09523	M15c	**Vegetation**: Rocky and species poor deergrass dominated M15c. **Moss layer**: Little to no bog-mosses present. **Grazing impacts**: Deergrass dominance and bare peat patches are likely associated with grazing pressure. **Erosion**: Micro-erosion features evident as bare peat through open vegetation. Small erosion features also present. **Pools**: No bog pools present. Ground surface dry. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: Area unlikely to be normally peat forming.	

T11	NC 46713 09427	M15c	**Vegetation**: A slope of rocky M15c with good cover of vegetation and a more even mix of species rather than deergrass dominated. Bog asphodel was common. There was some M25a and trickling water nearby. **Moss layer**: Some hummocks of woolly fringe moss beside M25a. **Grazing impacts**: Hoof prints were seen in the vegetation. **Erosion**: Small patches of micro-erosion features evident. **Pools**: There were several small pools. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: Wet area but unlikely to be normally forming peat as few bog-mosses present.	
T12	NC 46915 08855	M15c and M17b	**Vegetation**: A matrix of M17b and M15c. This was generally poor with more M15 present. **Moss layer**: Patchy, thin moss coverage, with some bare patches of soil. **Grazing impacts**: Some deer dung noted in this area, along with cropped vegetation. **Erosion**: Bare patches of peat, though no active erosion channels recorded. **Pools**: Water recorded pooling in bare areas, however, no bog pools record. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: While there was some coverage of bog-mosses and surface water, the area is unlikely to be actively peat forming.	
T13	NC 46390 09004	M15c	**Vegetation**: M15c with bare patches. **Moss layer**: Little or no bog-mosses present. **Grazing impacts**: Deergrass dominance and bare peat patches are likely associated with grazing pressure. Evidence of cropped vegetation recorded. **Erosion**: Bare patches of peat, though no active erosion channels recorded. **Pools**: No bog pools recorded. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: Active peat formation considered unlikely.	
T14	NC 45672 08932	M15c	**Vegetation**: M15c vegetation but might be small pockets of deeper peat present. Vegetation was open heather, deergrass and purple moor-grass. Bog asphodel was common. **Moss layer**: Woolly fringe moss was the most common moss. Bog-moss were only occasional. **Grazing impacts**: Grazing pressure was evident with hoof prints and dung. **Erosion**: Micro-erosion features were evident as small patches of bare peat. **Pools**: One pool at location with bog-mosses present. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: Fairly wet area but unlikely to be normally forming peat as few bog-mosses present.	

T14 – Option (completed by Wood, October 2020)	NC 45810 09163	M15c	***Vegetation**: Rocky and species poor deergrass dominated M15c.* ***Moss layer**: Little to no bog-mosses present.* ***Grazing impacts**: Deergrass dominance and bare peat patches are likely associated with grazing pressure.* ***Erosion**: Micro-erosion features evident as bare peat through open vegetation.* ***Pools**: No bog pools present. Occasional surface water over peat.* ***PCA**: Modified.* ***Peatland category**: Intermediate.* ***Evidence for peat formation**: Area unlikely to be normally peat forming.*	
T15	NC 46365 08448	M15c	**Vegetation**: M15c, with sparse coverage and several open bare areas. Area of M25a recorded roughly 10m from the GPS turbine location (visible as lighter green strip in second photo). **Moss layer**: Bog-mosses only present in small patches, and was thin where recorded. **Grazing impacts**: Hoof prints present. Deergrass dominance and bare peat patches are likely associated with grazing pressure. **Erosion**: Micro-erosion features were common. No large erosion features recorded. **Pools**: No pools recorded. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: Unlikely to be normally forming peat as few bog-mosses present and no surface water.	
T16	NC 45753 08286	M17a	**Vegetation**: There was a patch of M17a which extended in a small band to this location within M15c heath on the slopes. There was a fairly even mix of deergrass, purple moor-grass, heather, cross-leaved heath and bog myrtle over bog-mosses with occasional round-leaved sundews. There were tiny patches of M19 (ca. 2×2m). **Moss layer**: There was a near complete carpet of bog-mosses with a range of species, but no evidence of hummocks. **Grazing impacts**: Grazing impacts appeared relatively low. **Erosion**: There was no evidence of erosion at this location. **Pools**: There were no pools or surface water but it was wet underfoot. **PCA**: Modified. **Peatland category**: Intermediate-good. **Evidence for peat formation**: There was a near complete carpet of bog-mosses but no evidence of hummocks and hollows or surface water. Peat formation possible.	

T17	NC 46588 07358	M15c	**Vegetation**: An area of M15c, which appears to be on shallow peat. The vegetation was slightly taller than elsewhere with a mixture of purple moor-grass, deergrass, common cottongrass, heather and cross-leaved heath. Tormentil and bog asphodel were common. There was occasionally lousewort present. There was a small patch of M25a nearby. **Moss layer**: Little or no bog-mosses present. **Grazing impacts**: Grazed with some nibbled stems and bare peat areas with hoof prints. **Erosion**: Bare peat patches in the vegetation. **Pools**: No pools present. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: Unlikely to be normally forming peat.	 
T17 – Option	NC 46566 07472	M15c	**Vegetation**: M15c where heather, deergrass, purple moor-grass and cross-leaved heath were all evenly abundant. Nearby there was a line of water movement. Possible outflow of groundwater, but no spring head evident. Likely overland flow. **Moss layer**: There were some limited patches of bog-moss. **Grazing impacts**: Grazed with some nibbled stems and bare peat areas with hoof prints. **Erosion**: Micro-erosion features were evident with many small bare patches of peat. **Pools**: No bog pools were present. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: Unlikely to be normally forming peat.	  
T18	NC 47088 07270	M15c	**Vegetation**: Species poor deergrass dominated M15c. The peat depth was possibly deeper than 0.5m. Bumpy surface pattern from erosion and deergrass. **Moss layer**: Little to no bog-mosses present. **Grazing impacts**: Deergrass dominance is likely associated with grazing pressure. **Erosion**: Micro-erosion features evident as bare peat through open vegetation. **Pools**: Occasional pools, including one by turbine location. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: Area unlikely to be normally peat forming.	  
T18 - Option	NC 47028 07290	M15c	**Vegetation**: This location was species poor, deergrass dominated, M15c but it was likely over deep peat (>0.5m). It had very little hare's tail-cottongrass. **Moss layer**: Little to no bog-mosses present. **Grazing impacts**: Deergrass dominance is likely associated with grazing pressure. Hoof prints were common. **Erosion**: Micro-erosion features evident as bare peat through open vegetation. **Pools**: Surface water was puddling in bare peat patches. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: Area unlikely to be normally peat forming.	  

T19	NC 46860 06752	M15/M17	**Vegetation**: A transition of M15/M17, though this particular area tended more towards M17. **Moss layer**: Bog-moss coverage was patchy, though could be somewhat thick where it was present. **Grazing impacts**: Impacts of grazing evident in the form of cropped vegetation and deer dung. **Erosion**: Several drainage ditches nearby, one of which was a few metres from the location. **Pools**: No evidence of pooling was recorded. **PCA**: Modified. **Peatland category**: Intermediate. **Evidence for peat formation**: Area unlikely to be normally peat forming.	  
T20	NC 47532 06838	M17a	**Vegetation**: This area was M17a, with a few M2a pools located nearby. The vegetation was open, with deergrass domain, but a mixture of other species present, including heather, cross-leaved heath, cottongrasses with round-leaved sundews and great sundew present beside the pools. **Moss layer**: Mostly red bog-moss or bare peat between the vegetation but occasional small bog-moss hummocks, ca. 20cm high including magellanic bog-moss. Bog-mosses were more common around the pools. **Grazing impacts**: Impacts of grazing evident in the form of cropped vegetation and deer dung. **Erosion**: Micro-erosion features were evident. There were drainage ditches nearby. **Pools**: M2a pools present. **PCA**: Modified and drained, but elements of Near Natural habitat remain. **Peatland category**: Intermediate-good. **Evidence for peat formation**: Bog-mosses were present and there were pools and surface water despite drains being nearby. Some peat formation was likely.	  

Conclusion

A total of 23 of the proposed turbine locations were visited in September 2020 by Alba Ecology. An additional four turbine locations were visited by a Wood Ecologist in October 2020 and the vegetation present was reported on. The vegetation was typically either wet heath NVC community M15c or blanket bog with NVC communities M17a, M17b and M19 all represented.

Impacts from deer grazing were noted throughout the vegetation, including hoof prints and dung. Micro-erosion features were very common within the bog habitat in the form of bare peat patches within the vegetation.

Given the lack of surface water-logging features, bog-mosses and hummock and hollows, it was considered that the blanket bog was likely to be largely inactive and in intermediate condition. However, this does not preclude that limited peat formation may occur at some locations under some circumstances – where this was considered possible it has been highlighted.

Surface water and bog-moss cover was more common in some areas and some of the blanket bog, e.g. the M17a blanket bog, particular at T04 (original location, now removed), T16 and T20, was considered to be in intermediate to good condition and may be active or partially active.

References

Glenk, K., Martin-Ortega, J., Byg, A. 2017. *Online Condition Assessment Support Tool. Peatland Action*, Scottish Natural Heritage.

Lindsay, R. 1995. Bogs: *The Ecology, Classification and Conservation of Ombrotrophic Mires*. SNH.

Lindsay, R. Birnie, R. and Clough, J. 2014a. *IUCN UK Committee Peatland Programme Briefing Note No.1 Peat Bog Ecosystems: Key Definitions*. IUCN UK Peatland Programme.

Lindsay, R. Birnie, R. and Clough, J. 2014b. *IUCN UK Committee Peatland Programme Briefing Note No.2 Peat Bog Ecosystems: Structure, Form, State and Condition*. IUCN UK Peatland Programme.

Lindsay, R. Birnie, R. and Clough, J. 2014c. I*UCN UK Committee Peatland Programme Briefing Note No.7 Grazing and Trampling.* IUCN UK Peatland Programme.

Peatland Action, 2016. *Peatland Condition Assessment Guide*. https://www.nature.scot/sites/default/files/2017-10/Guidance-Peatland-Action-Peatland-Condition-Assessment-Guide-A1916874.pdf.

Annex 1 – Decision-making, design optimisation and final layout

The following has been prepared by Wood, following completion of the Turbine Vegetation Assessment prepared by Alba Ecology.

Table 8.2.4 provides a breakdown of all evaluated turbine location options, and based on the information presented within this assessment, has helped inform the decision-making during subsequent design workshops. Wherever possible turbines have been sited to ensure that areas of blanket bog vegetation, and in particular, the most sensitive areas of vegetation have been avoided as far as possible. Rationale is presented for siting or removal of turbines. The Final layout presented will be assessed within the EIA **Chapter 8: Ecology**.

Table 8.2.4: Details of the turbine locations, decision making and final layout.

Initial design layout as provided on 11/09/20 **Additional turbine locations evaluated by Wood (italics)**	**Grid reference**	**Decision during Design Workshops**	**Rationale**	**Final layout**
T01	NC 45108 11121	Further micro-siting	Minor turbine positioning optimisation over wet heath habitat considered unlikely to be normally peat forming.	NC 45164 11083
T02	NC 44607 10839	Further micro-siting	Optimise turbine positioning over wet heath habitat considered unlikely to be normally peat forming, minimising potential impact to small area of blanket bog.	NC 44595 10950
T02 - Option	NC 44550 10839	Removal	Removal due to presence of M19 and M17a, considered unlikely to be normally peat forming.	
T03	NC 45656 10892	Removal	Removal due to presence of M17a blanket bog considered to be partially active.	
T03 - Option	***NC 45618 10923***	Further micro-siting	Optimise turbine positioning over wet heath and marshy grassland, minimising impact to blanket bog in an area unlikely to be normally peat forming.	NC 45618 10922
T04	NC 46140 10678	Removal	Removal due to presence of near natural blanket bog, an area likely to be active forming peat.	
T04 - Option	***NC 45979 10739***	No change	Optimise turbine positioning over wet heath, minimising impact to blanket bog and avoidance of near natural blanket bog. Sited in an area unlikely to be normally peat-forming.	NC 45980 10740
T05	NC 44780 10490	Further micro-siting	Optimise turbine positioning over wet heath, minimising impact to blanket bog. Sited in an area unlikely to be normally peat forming.	NC 44768 10506
T06	NC 46023 10241	No change	Optimise turbine positioning within area of blanket bog (M19) considered unlikely to be normally peat forming; surrounding M17b blanket bog identified through PCA as modified/drained/actively eroding.	NC 46023 10241
T07	NC 45487 10137	Further micro-siting	Optimise turbine positioning over wet heath and lower quality blanket bog (identified through the PCA as modified/drained/actively eroding), minimising impact to area of M17a where peat formation was considered possible.	NC 45495 10095
T08	NC 44872 10018	No change	Optimise turbine positioning minimising impact to a transitional wet heath/blanket bog habitat considered unlikely to be normally peat forming.	NC 44872 10018

T09	NC 45566 09700	Removal	Removal due to presence of M17b blanket bog considered unlikely to be normally peat forming, but some possible.	
T09 - Option	***NC 45597 09765***	No change	Optimise turbine positioning over wet heath minimising impact to blanket bog, in an area unlikely to be normally peat forming.	NC 45597 09695
T10	NC 46198 09516	No change	Minor turbine positioning optimisation in an area considered unlikely to be normally peat forming.	NC 46198 09516
T11	NC 46722 09421	No change	Minor turbine positioning optimisation in an area considered unlikely to be normally peat forming.	NC 46722 09421
T12	NC 46915 08855	No change	Minor turbine positioning optimisation in an area considered unlikely to be actively peat forming.	NC 46915 08855
T13	NC 46390 09004	No change	Minor turbine positioning optimisation in an area considered unlikely to be normally peat forming.	NC 46390 09004
T14	NC 45674 08931	Removal	Removal due to combination of potential pockets of deeper peat and wetter conditions.	
T14 - Option	***NC 45810 09163***	No change	Minor turbine positioning optimisation in an area considered unlikely to be normally peat forming.	NC 45810 09163
T15	NC 46365 08448	No change	Minor turbine positioning optimisation in an area considered unlikely to be normally peat forming.	NC 46334 08448
T16	NC 45755 08290	Further micro-siting	Optimise turbine positioning over wet heath minimising impact to small area of M17a blanket bog, where peat formation was considered possible.	NC 45756 08237
T17	NC 46591 07357	Removal	Removal due to preferential position of T17- Option.	
T17 – Option	NC 46564 07472	No change	Minor turbine positioning optimisation in an area of wet heath and marshy grassland considered unlikely to be normally peat forming, avoiding nearby area of M17a.	NC 46564 07472
T18	NC 47082 07264	Further micro-siting	Optimise turbine positioning over an area of species poor deergrass dominated wet heath on an area unlikely to be normally peat forming.	NC 47025 07297
T18 – Option	NC 47025 07297	Removal	Removal due to the presence of species poor wet heath considered likely to be over deep peat.	
T19	NC 46860 06752	Further micro-siting	Optimise turbine positioning over an area of M15:M17 transitional habitat, considered unlikely to be normally peat forming.	NC 46838 06821
T20	NC 47531 06835	Further micro-siting	Optimise turbine positioning in order to avoid the area of M17a with elements of Near Natural habitat were considered present and some peat formation was likely. Sited onto transitional M15:M17 with presence of drainage ditches nearby.	NC 47468 06810

Annex 2 – Summary Table in relation to Infrastructure and Habitats

The following has been prepared by Wood, following completion of the NVC and Turbine Vegetation Assessment prepared by Alba Ecology.

Table 8.2.5: Site Infrastructure and Habitats

Infrastructure	Grid Reference (Chapter 3)		Peat Depth (cm) (Chapter 11)	Phase 1 Habitats (Technical Appendix 8.1)	NVC (Technical Appendix 8.2)	Altitude (m)
Turbines						
T1	245164	911083	30	Wet dwarf shrub heath	M15c	330m
T2	244595	910950	30	Wet dwarf shrub heath	M15c	338m
T3	245618	910922	30	Wet heath/Marshy grassland/Blanket bog mosaic	M15c/M25a/M17a	321m
T4	245980	910740	170	Wet dwarf shrub heath	M15c	337m
T5	244768	910506	10	Wet dwarf shrub heath/Blanket bog mosaic	M15c/M17a	291m
T6	246023	910241	50	Blanket bog	M17b/M19	360m
T7	245495	910095	110	Blanket bog	M17a	327m
T8	244872	910018	170	Wet dwarf shrub heath/Blanket bog mosaic	M15c/M17/M19	287m
T9	245597	909695	50	Wet dwarf shrub heath	M15c	381m
T10	246198	909516	30	Wet dwarf shrub heath	M15c	385m
T11	246722	909421	50	Wet dwarf shrub heath/Marshy grassland	M15c/M25a	325m
T12	246915	908855	70	Wet dwarf shrub heath	M15c	294m
T13	246390	909004	40	Wet dwarf shrub heath/Dry dwarf shrub heath	M15c/H10a	313m
T14	245810	909163	20	Wet dwarf shrub heath/Marshy grassland	M15c/M25a	316m

T15	246334	908448	30	Wet dwarf shrub heath/Marshy grassland	M15c/M25a	263m
T16	245756	908237	30	Wet dwarf shrub heath/Blanket bog	M15c /M17a	253m
T17	246564	907472	70	Wet dwarf shrub heath/Marshy grassland	M15c/M25a	256m
T18	247025	907297	70	Wet dwarf shrub heath/Blanket bog transition	M15:M17	292m
T19	246838	906821	50	Wet dwarf shrub heath/Blanket bog transition	M15:M17	267m
T20	247468	906810	40	Wet dwarf shrub heath/Blanket bog transition	M15:M17 /M15c	314m
Borrow Pits						
1	252763	903638	40	Disturbed ground/Marshy grassland/ Blanket bog	Mapped during Phase 1 – former borrow pit not NVC classifiable.	294m
2	247570	906650	40	Wet dwarf shrub heath/Blanket bog mosaic	M15:M17/M15c	305m
3	247570	906650	40	Wet dwarf shrub heath	M15c/H10a/M19	352m
4	246628	909653	90	Blanket bog	M15c/M17b:M19/M17b	333m
5	244487	910769	90	Wet dwarf shrub heath/Blanket bog	M15c/M25a/M17a/H10a	325m
Substations / compounds						
Substation/Storage compounds	246287	908738	30	Wet dwarf shrub heath	M15c/M25a/H10a	278m
Temp. construction compound/Batching	246510	908692	30	Marshy grassland	N/A	194m
Lidar compound	245904	909292	30	Wet dwarf shrub heath	M15c	348m